



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/718,653

11/24/2003

Kazuo Teshirogi

032131

1182

38834 7590 10/17/2007
WESTERMAN, HATTORI, DANIELS & ADRIAN, LLP
1250 CONNECTICUT AVENUE, NW
SUITE 700
WASHINGTON, DC 20036

EXAMINER

GOFF II, JOHN L

ART UNIT

PAPER NUMBER

1791

MAIL DATE

DELIVERY MODE

10/17/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/718,653	Applicant(s) TESHIROGI ET AL.	
	Examiner John L. Goff	Art Unit 1733	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 August 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) 4-14, 16 and 17 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3, 15 and 18 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 24 November 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. This action is in response to the amendment filed on 8/6/07.
2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claim Rejections - 35 USC § 103

3. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).
4. Claims 1-3 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nagatomi et al. (JP 54124968 and the abstract) in view of either one of Inada et al. (JP 06104317 and the abstract) or Shoffner (U.S. Patent 3,749,621), Da Costa (U.S. Patent 3,040,489), either one of Tsunashima et al. (U.S. Patent 5,051,475) or Homma et al. (U.S. Patent 5,336,703), and optionally Pool (U.S. Patent 3,501,128).

Nagatomi et al. disclose a method of manufacturing a semiconductor element comprising providing a semiconductor substrate (3 of Figure 3), placing an adhesive film (4 of Figure 3) on a surface of the semiconductor substrate, providing a cylindrical roller (15 of Figure 3) having a

Art Unit: 1733

heat-generating part (15c of Figure 3) in a central portion of the roller extending in an axial direction of the roller, pressing the roller heated to a laminating temperature onto the adhesive film, rolling the roller the length of the adhesive film to laminate the adhesive film to the semiconductor substrate by heat only from the heat-generating part, and dividing the semiconductor substrate into a plurality of semiconductor elements (See the abstract). Nagatomi et al. do not disclose the cylindrical roller is formed of metal having an outermost layer of elastically deformable fluoride resin provided thereon. Inada et al. directed to forming a TAB tape, i.e. a tape automated bonding tape which is used to adhere semiconductor elements, teaches pressing the tape with a heated pressing roll comprising a metal body with an outer Teflon, i.e. fluoride resin, layer thereon such that the adhesive of the tape does not stick to the roller (See the abstract). Shoffner discloses a pressing roller for securing a covering wherein the roller comprises a metal body with an outer Teflon, i.e. fluoride resin, layer thereon, e.g. having a thickness of 0.01 to 0.09 in., such that the roller is free of adhesion to other surfaces and is resistant to corrosion (Column 1, lines 43-50 and Column 3, lines 74-75 and Column 4, lines 1-5 and Column 5, lines 21-23). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use as the cylindrical roller taught by Nagatomi et al. the metal cylindrical roller with an outer fluoride resin layer as shown by either one of Inada et al. or Shoffner to laminate the adhesive film without the adhesive sticking to the roller and the roller being resistant to corrosion.

Regarding the limitation of the “roller having a diameter of about 20-50 mm”, Nagatomi et al. do not teach any specific diameter for the roller, it being noted Nagatomi et al. are not limited to any particular diameter. Da Costa discloses a cylindrical roller for rolling the length of

Art Unit: 1733

a film covering a semiconductor substrate for dividing the semiconductor substrate into a plurality of semiconductor elements wherein the roller has a diameter of 32 mm (Figure 4 and Column 2, lines 55-68 and Column 6, lines 18-21). Absent any unexpected results, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use as the diameter of the roller taught by Nagatomi et al. as modified by either one of Inada et al. or Shoffner those known in the art as capable for pressing the length of a film covering a semiconductor substrate such as that shown by Da Costa.

Regarding the limitation of an “elastically deformable resin layer” and “absorbing unevenness of the outer surface of the roller and unevenness of a surface of the film by elastic deformation of the elastically deformable resin”, it is noted Teflon is well taken in the art as an elastically deformable material as shown by Pool (Column 3, lines 33-35). One of ordinary skill in the art at the time the invention was made would have readily appreciated that the outer layer of Teflon taught by Nagatomi et al. as modified by either one of Inada et al. or Shoffner is elastically deformable as optionally shown by Pool such that the layer would absorb unevenness of the outer surface of the roller and unevenness of a surface of the film by elastic deformation as the elastically deformable outer layer including its thickness is consistent and in agreement with applicants claims and specification (See page 15, lines 16-19 and 34-37) as suitable for absorbing unevenness in this manner.

Regarding the limitation of the “roller presses the film with a pressing load of 10-20N”, Nagatomi et al. do not specify any particular pressing load. Nagatomi et al. do not require any particular pressing load only teaching pressure bonding the adhesive film with the roller by hand. It is well taken in the art of pressure bonding an adhesive substrate such as a tape to another

Art Unit: 1733

substrate with a hand roller that a pressing load of up to 50 N may be applied as shown by either one of Tsunashima et al. or Homma et al. (Column 8, lines 40-43 of Tsunashima et al. and Column 13, lines 40-44 of Homma et al.). Absent any unexpected results, it would have been obvious to one of ordinary skill in the art at the time the invention was made to experimentally determine the pressing load for the roller in Nagatomi et al. as modified by either one of Inada et al. or Shoffner as a function of adequately applying force for pressure bonding the adhesive film as doing so would have required nothing more than ordinary skill and routine experimentation, it being noted the claimed pressing load is easily achieved by a hand roller as shown by either one of Tsunashima et al. or Homma et al.

Regarding the limitation of “wherein the heat-generating part is heated to about 200 °C” and “about 5 seconds after the roller is pressed to an area of the principal surface of the semiconductor substrate said area returns to a temperature about equal to the area’s temperature prior to contact with the roller”, Nagatomi et al. teach the heat-generating part is heated to between 50 and 300 °C and specifically depict about 200 °C (6 of Figure 5). Additionally, as the materials and method taught by Nagatomi et al. as modified by either one of Inada et al. or Shoffner, Da Costa, either one of Tsunashima et al. or Homma et al., and optionally Pool is consistent and in agreement with that claimed and described by applicants as resulting in about 5 seconds after the roller is pressed to an area of the principal surface of the semiconductor substrate said area returns to a temperature about equal to the area’s temperature prior to contact with the roller one of ordinary skill in the art at the time the invention was made would have readily expected the method taught by Nagatomi et al. as modified by either one of Inada et al. or Shoffner, Da Costa, either one of Tsunashima et al. or Homma et al., and optionally Pool to

Art Unit: 1733

result in the same. In the event it is shown the depiction of about 200 °C in Nagatomi et al. is not a specific disclosure the following rejection would apply. It would have been obvious to one of ordinary skill in the art at the time the invention was made to experimentally determine the heat temperature of the heat-generating part in Nagatomi et al. as modified by either one of Inada et al. or Shoffner, Da Costa, either one of Tsunashima et al. or Homma et al., and optionally Pool with the range suggested by Nagatomi et al. as a function of the specific materials used as doing so would have required nothing more than ordinary skill and routine experimentation wherein about 200 °C would have readily been expected as a value lying in the middle of the range suggested by Nagatomi et al.

Regarding claim 18, Nagatomi et al. do not disclose the difference in temperature between the heat generating part and the film during rolling is about 20 °C. However, there is intrinsically a temperature difference between the heat generating part and the film as the outer layers of roller located between the heat generating part and the film will absorb heat. Absent any unexpected results, it would have been obvious to one of ordinary skill in the art at the time the invention was made to experimentally determine the temperature difference between the heat generating part and the film in Nagatomi et al. as modified by either one of Inada et al. or Shoffner as a function of supplying enough laminating heat to the film while accounting for the heat absorption of the outer layers of the rollers as doing so would have required nothing more than ordinary skill and routine experimentation.

Art Unit: 1733

5. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nagatomi et al., either one of Inada et al. or Shoffner, Da Costa, either one of Tsunashima et al. or Homma et al., and optionally Pool as applied to claims 1-3 and 18 above, and further, in view of the admitted prior art (Specification pages 1-3).

Nagatomi et al., either one of Inada et al. or Shoffner, Da Costa, either one of Tsunashima et al. or Homma et al., and optionally Pool as described above teach all of the limitations in claim 15 except for a specific teaching of thinning the adhering surface of the semiconductor substrate. The admitted prior art is directed to laminating an adhesive film onto a surface of a semiconductor substrate wherein the semiconductor substrate surface is thinned, e.g. by grinding, prior to lamination (Figure 1 and Page 1, lines 26-33 and Page 2, lines 31-37 and Page 3, lines 1-11). It would have been obvious to one of ordinary skill in the art at the time the invention was made to include in Nagatomi et al. as modified by either one of Inada et al. or Shoffner, Da Costa, either one of Tsunashima et al. or Homma et al., and optionally Pool to include a step of thinning the adhering surface of the semiconductor substrate prior to lamination as shown by the admitted prior art to form semiconductor elements having a reduced thickness.

Response to Arguments

6. Applicant's arguments with respect to claims 1-3, 15, and 18 have been considered but are moot in view of the new ground(s) of rejection.

Applicants argue, "Hence, using only the pressing roller as a source of heating reduces the influence of thermal expansion on the semiconductor substrate and there is no generation of cracking of the semiconductor substrate.".

Art Unit: 1733

The new limitations are addressed above it being noted no generation of cracking of the semiconductor substrate is considered to follow from Nagatomi et al. as modified by either one of Inada et al. or Shoffner, Da Costa, either one of Tsunashima et al. or Homma et al., and optionally Pool as Nagatomi et al. teach applying heat to laminate the film on the semiconductor substrate only from the heat-generating part heated to about 200 °C wherein one of ordinary skill in the art would readily expect the roller including heat-generating part taught by Nagatomi et al. rolled over the semiconductor substrate to function in an analogous manner to the roller including heat-generating part rolled over the semiconductor substrate claimed and disclosed by applicant, i.e. about 5 seconds after the roller is pressed to an area of the principal surface of the semiconductor substrate said area returns to a temperature about equal to the area's temperature prior to contact with the roller.

Conclusion

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

Art Unit: 1733

however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to **John L. Goff** whose telephone number is **(571) 272-1216**. The examiner can normally be reached on M-F (7:15 AM - 3:45 PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard Crispino can be reached on (571) 272-1226. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



John L. Goff
Primary Examiner
Art Unit 1791